Amendments to the Specification:

Please replace paragraphs [0008] and [0009] of the published application (US 2005/0165563) with the following paragraphs:

-- **[0008]** FIGURES 1A through 1D show a flow chart of a method of predicting the accuracy of information supplied by sensors within fuel tanks during motion in accordance with an embodiment of the invention; ~~and~~

[0009] FIGURE 2 is a representative system for predicting the accuracy of information supplied by sensors within fuel tanks during motion in accordance with another embodiment of the present invention<u>; and</u>

[0009.1] <u>FIGURE 3 is a side elevational view of a fuel tank having a plurality of sensors</u>. --

Please replace paragraph [0012] of the published application (US 2005/0165563) with the following paragraph:

[0012] FIGURES 1A through 1D show a flow chart of a method 100 of predicting the accuracy of information supplied by sensors <u>304, 306, 308</u> within <u>a</u> fuel tank~~s~~ <u>300 (FIGURE 3)</u> experiencing motion in accordance with an embodiment of the invention. In this embodiment, the method 100 is initiated at block 102 by launching a web-based browser application. At a block 104, one or more height-to-volume files are input into the analysis program, along with one or more files defining the geometric definition of <u>the</u> ~~a~~ fuel tank <u>300</u> and a sensor configuration for analysis. The System and Sensor configuration files and height-to-volume files are saved to the user's account. A user may then select applicable height-to-volume files, system files, and sensor configuration files to run an analysis at block 106. The analysis is then initiated

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at block 108. The system configuration selected by the user is read into the analysis program at block 110, and the sensor configuration is read into the analysis program at block 112. The tank height-to-volume information is read in at block 114. As noted in block 114 of FIGURE 1A, the height-to-volume information varies with attitude because, generally speaking, a fuel tank may be geometrically non-linear resulting in different fuel plane height for every attitude of the same fuel quantity. Height-to-volume information may be obtained from a Computer Aided Design (CAD) model by placing the tank solid at a given attitude, and then slicing through the solid from top to bottom in incremental steps. Each slice is the volume of the solid at that height. If necessary, a conversion of the coordinates of the height-to-volume information must be performed at block 116 to agree with the coordinate system specified in the system configuration.

Please replace paragraph [0013] of the published application (US 2005/0165563) with the following paragraph:

[0013] With reference to FIGURE 1B, the method 100 continues by initiating an iteration loop, starting at the initial attitude at block 118 and continuing until all attitudes have been completed. The next step in the iteration loop, at block 120, mathematically transforms the coordinates of the sensor configuration based on new pitch and roll attitude geometry. A validation of the transformation is also performed at block 120. The method 100 further includes assigning height-to-volume array values to the new attitude at block 122. Next, at block 124, the height-to-volume information of the new attitude is expanded (via interpolation) to achieve sensor readings at one or more desired fuel (surface) plane-to-sensor intersections. A wetted volume on each transformed sensor <u>(e.g. wetted volumes 316, 318, 320 corresponding to sensors 304, 306, 308 in FIGURE 3)</u> is determined at every fuel (surface) plane-to-sensor intersection <u>(e.g. fuel plane 302 intersects sensors 304, 306, 308 at fuel plane-to-sensor intersections 310, 312, 314 in FIGURE 3)</u> at block 126. The quantity of fuel is calculated at block 128 for every

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fuel (surface) plane-to-sensor intersection 310, 312, 314 based on the sum of the wetted sensor volumes 316, 318, 320 plus or minus any gain.

Please replace paragraph [0019] of the published application (US 2005/0165563) with the following paragraph:

[0019] With continued reference to FIGURE 1C, if the fuel gauging system is determined to be non-linear (block 150), then the method 100 provides the option to optimize for one attitude or all attitudes of interest at block 152. If the user desires to optimize for only one attitude (block 154), then the method 100 begins iterating through all attitudes at block 156 in order to determine the errors based on the one selected attitude. It will be appreciated that optimization for only one attitude for a non-linear system permits the user to test a fixed value sensor - one that is optimized for only one attitude - against all other attitudes to get the resulting errors. Errors may be severe in this case, but it permits the user to determine if the errors are tolerable. At block 158, the method 100 begins iterating through each fuel (surface) plane-to-sensor intersection (*e.g.* fuel plane-to-sensor intersections 310, 312, 314 in FIGURE 3). Gain values of a preferred optimized attitude are assigned to the remaining attitudes at block 160. The method 100 then calculates quantities of fuel based on the sum of all wetted sensor volumes (*e.g.* wetted volumes 316, 318, 320 corresponding to sensors 304, 306, 308 in FIGURE 3) plus the optimized gain at block 162. An error is then calculated at block 164, and the method 100 proceeds to block 148 and outputs the computational results for import to an on-board computer (and also the secondary formatting for graphical display) at block 148.

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